

WG1 – AQ composite mapping

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FAIRMODE Technical Meeting, 24 & 25 June 2015, Aveiro, Portugal

Content

- » Composite mapping: basic idea
- » Methodological approach
- » FAIRMODE objectives
- » Obstacles & risks
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EU composite mapping exercise

» Objective:

- » Collect national, regional or local air quality assessment maps
- » Compile an overall composite EU air quality map
- » Use the map and the process as support to provide updated model QA/QC guidelines (MQO, assimilation,...)

EEA/ETC exercise in 2013

- » We are not reinventing the wheel!
- » Idea was already tested by the EEA/ETC in 2013 (Peter de Smet *et al*)
- » Input received from 19 countries!
- » Recommendation for FAIRMODE activity

**A European compilation
of national air quality maps
based on modelling**



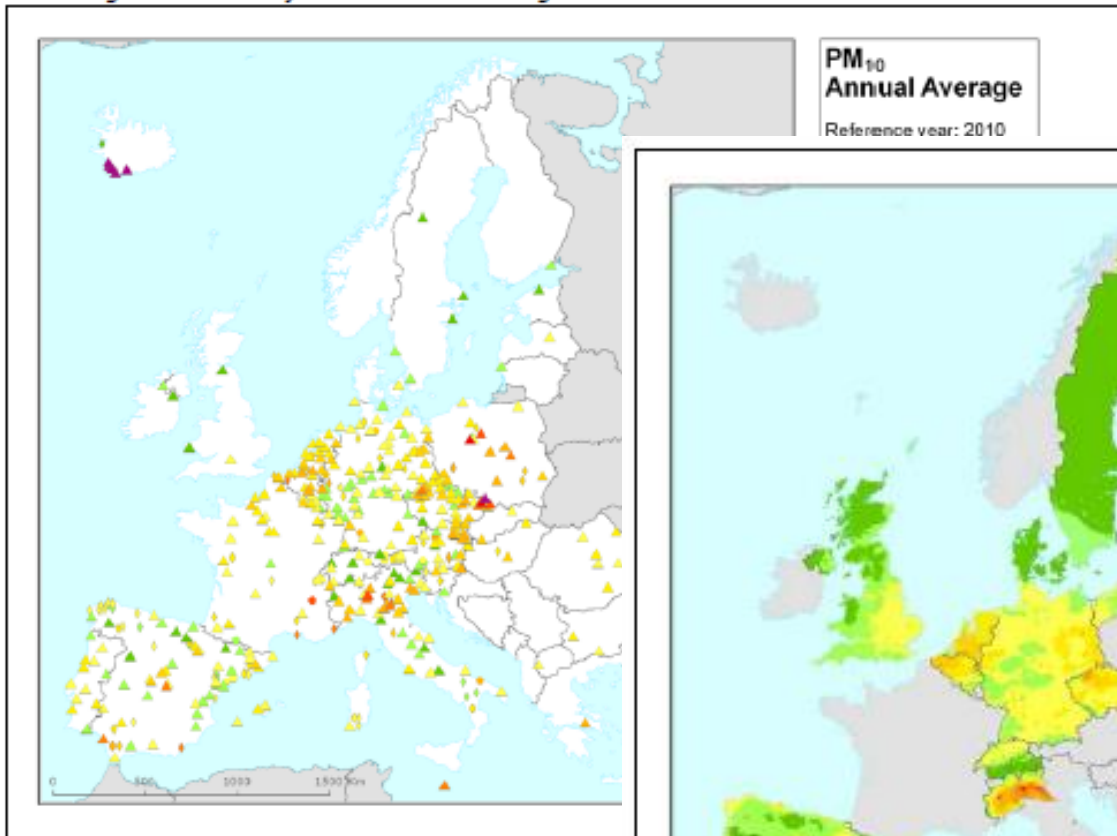
**ETC/ACM Technical Paper 2013/3
March 2013**

*Peter de Smet, Frank de Leeuw,
Jan Horálek, Pavel Kurfürst*

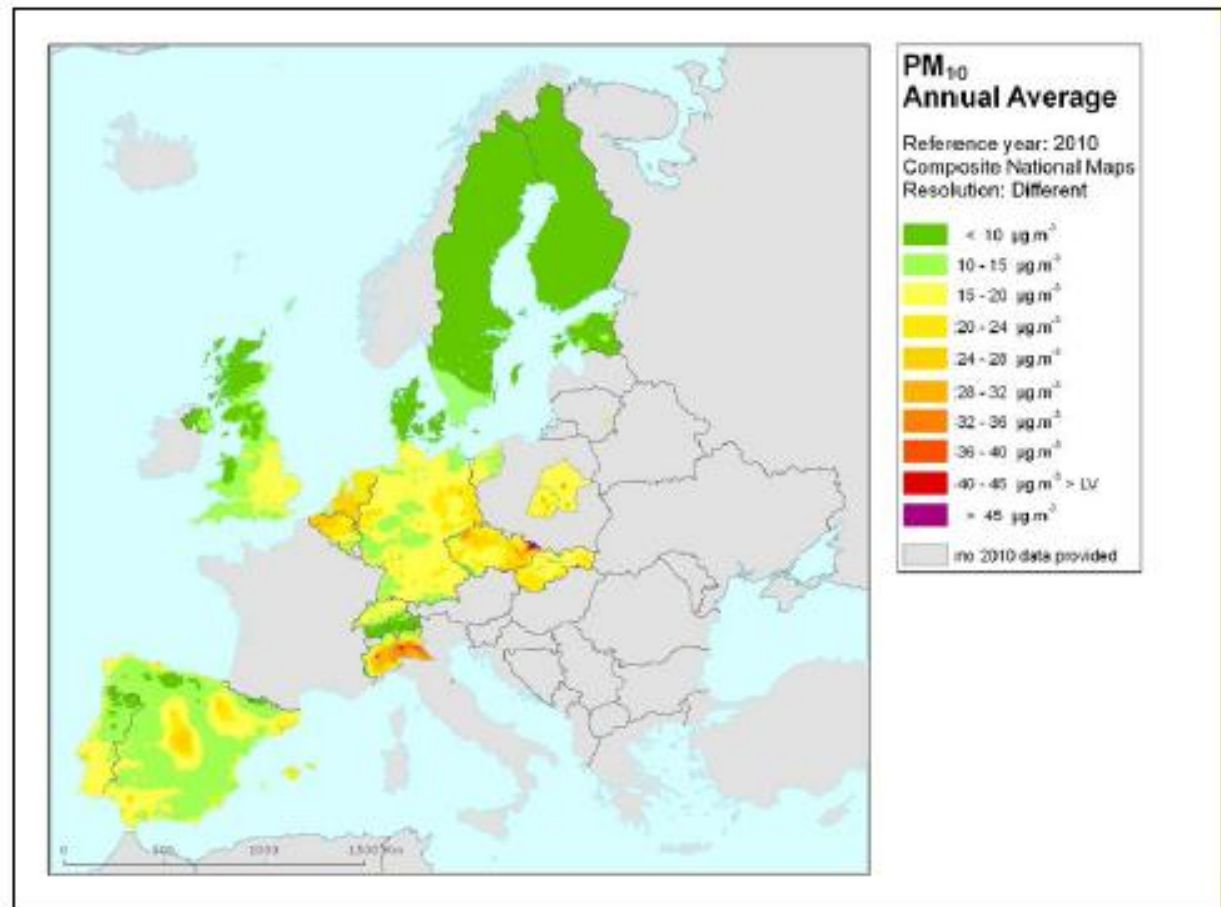


The European Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM) is a consortium of European institutes under contract of the European Environment Agency
RIVM UBA-V ÖKO AEAT EMISA CHMI NILU INERIS 45fera PBL CSIC

Assessment: from monitoring data towards maps...



Map 1a. European map with the annual average PM_{10} reported by the countries under EU legislation (EC (15



Map 1. European composite map of the annual average PM_{10} for 2010 based on national modelling contributions from countries and regions.

Technical issues encountered in the ETC exercise...

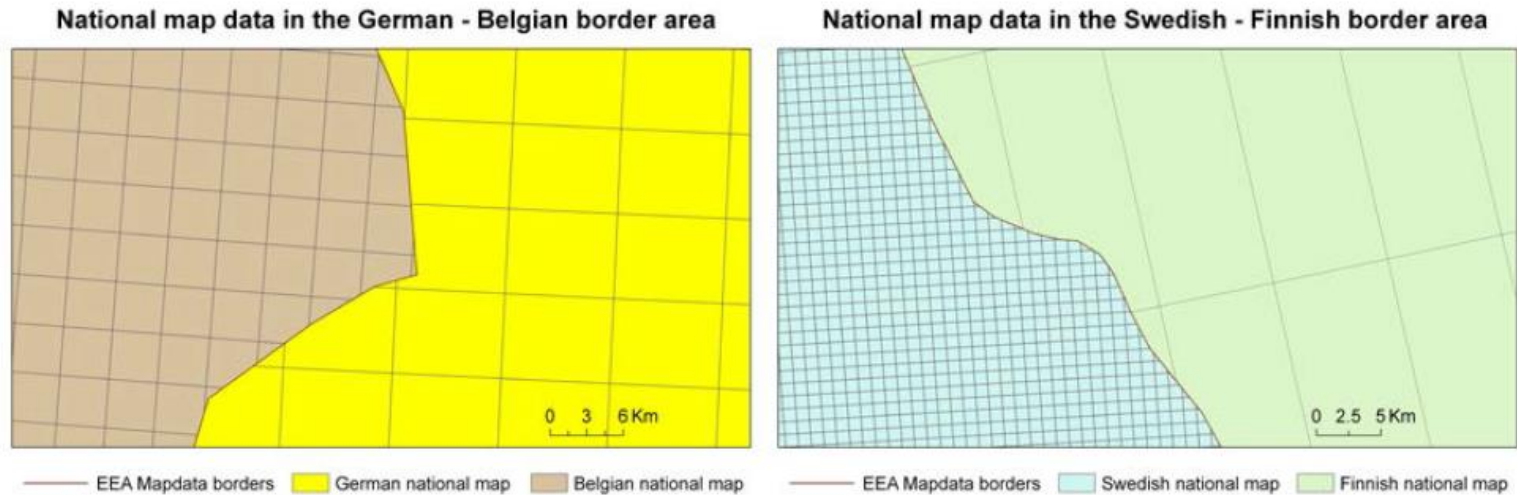
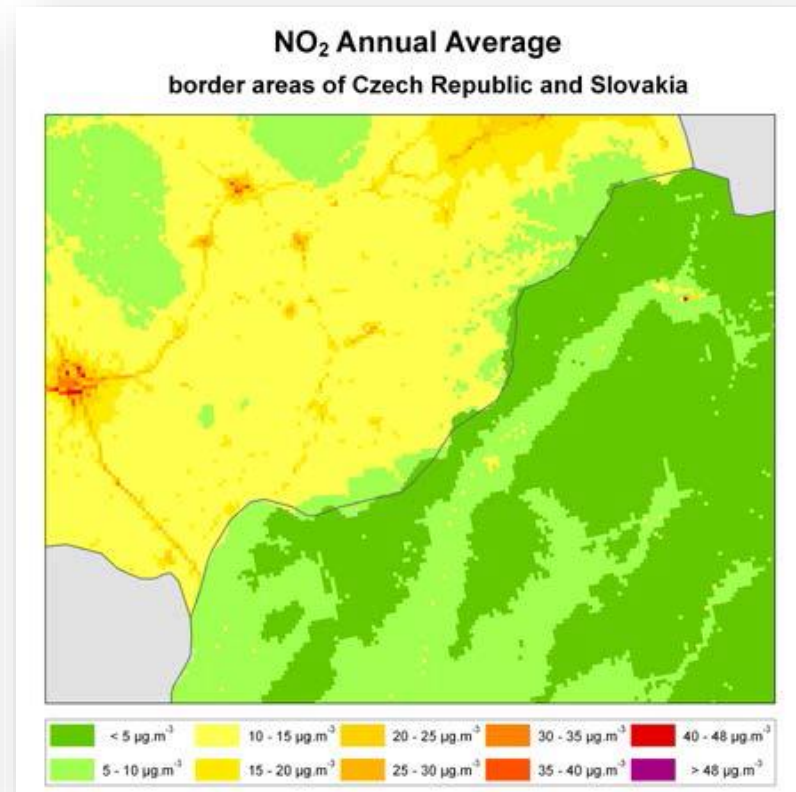
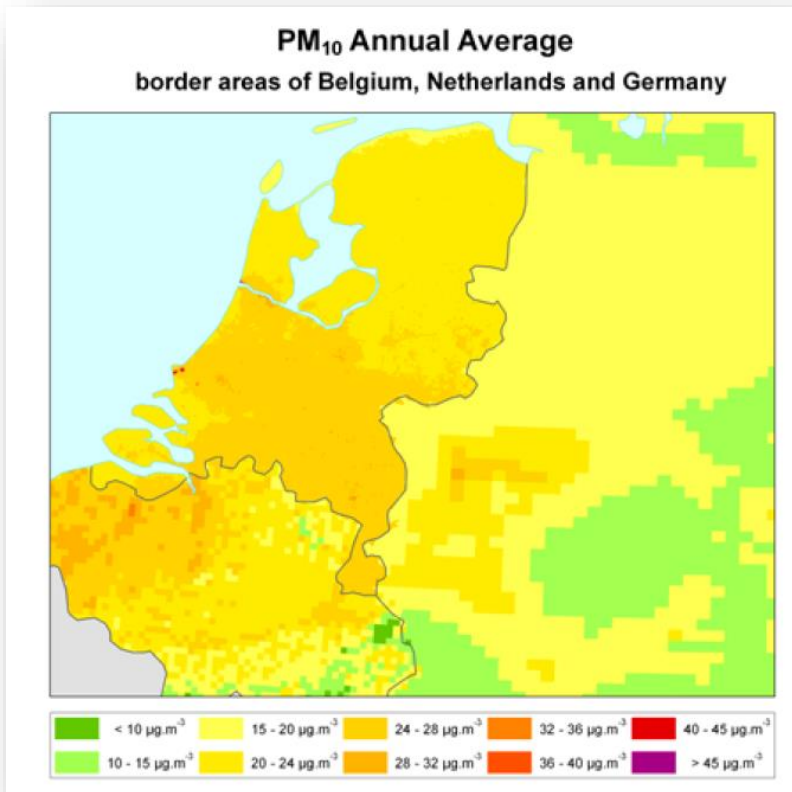


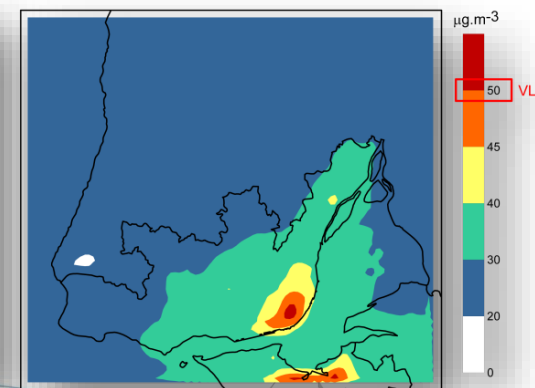
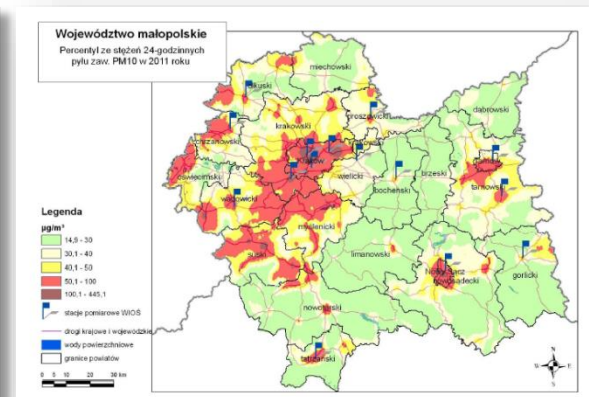
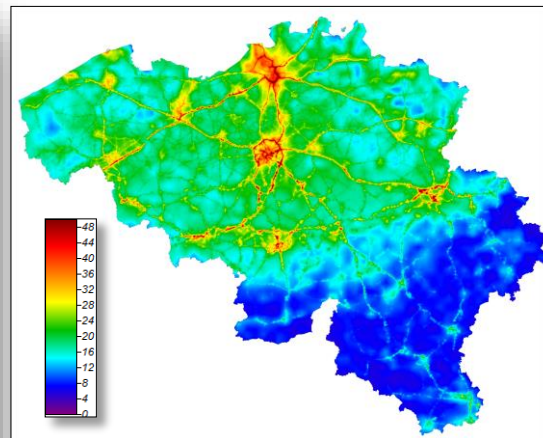
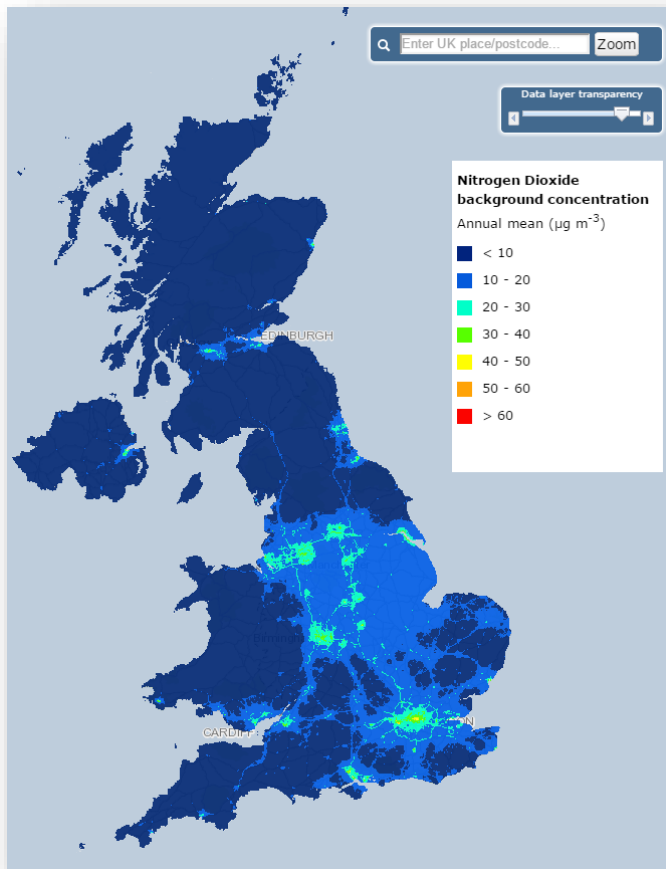
Figure 2. National map data at the German - Belgian (left) and Swedish - Finnish (right) borders illustrate the difference in grid resolution and orientation in the national maps.

Technical issues encountered in the ETC exercise...



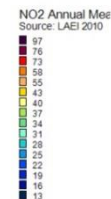
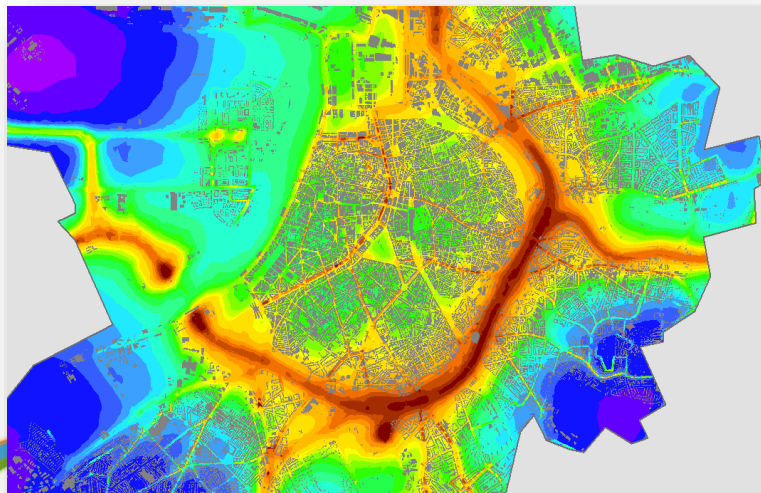
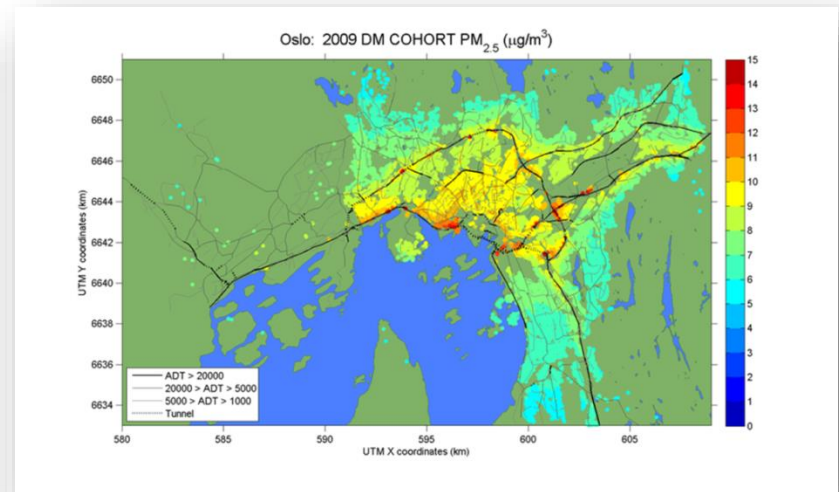
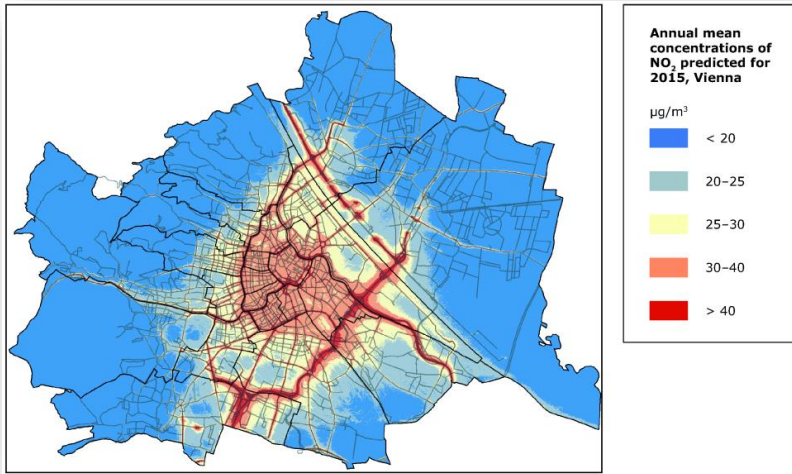
Suggested approach...

- » Start with background concentrations at country/regional level

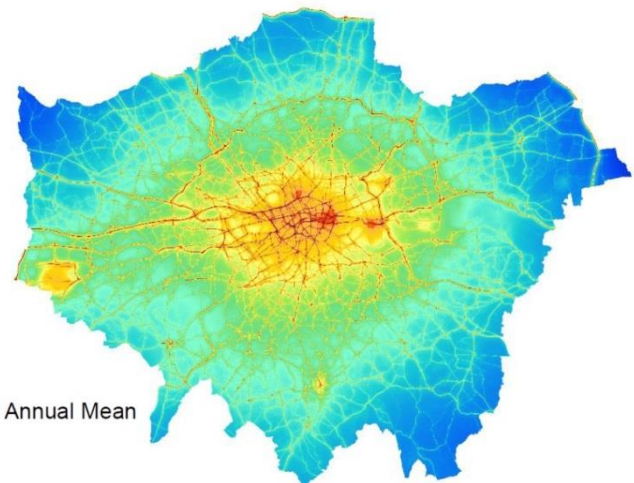


Suggested approach...

» When available including the urban scale



NO₂ 2010 Annual Mean



FAIRMODE objectives

- » Catalyst for discussions:
 - » Border effects between neighboring regions/countries
 - » (In)consistencies between urban and regional maps
 - » Use of data assimilation or data fusion techniques
 - » Quality and consistency of underlying emission inventories
 - » Choice of adequate spatial (and temporal) resolution
 - » Differences in model quality
- » Convince countries or regions that are not yet using models on a regular basis to participate in the process
- » Capacity building and learn from each other

What are the obstacles & risk?

- » Boarder effects:
 - » Trigger for “negative” inter-regional discussions?
- » Multiple maps (from different teams) for one region:
 - » Trigger for competition?
- » Reporting of additional modelled exceedances
 - » Risk for compliance checking by EC → Start up in a “safe space”

Link with e-Reporting

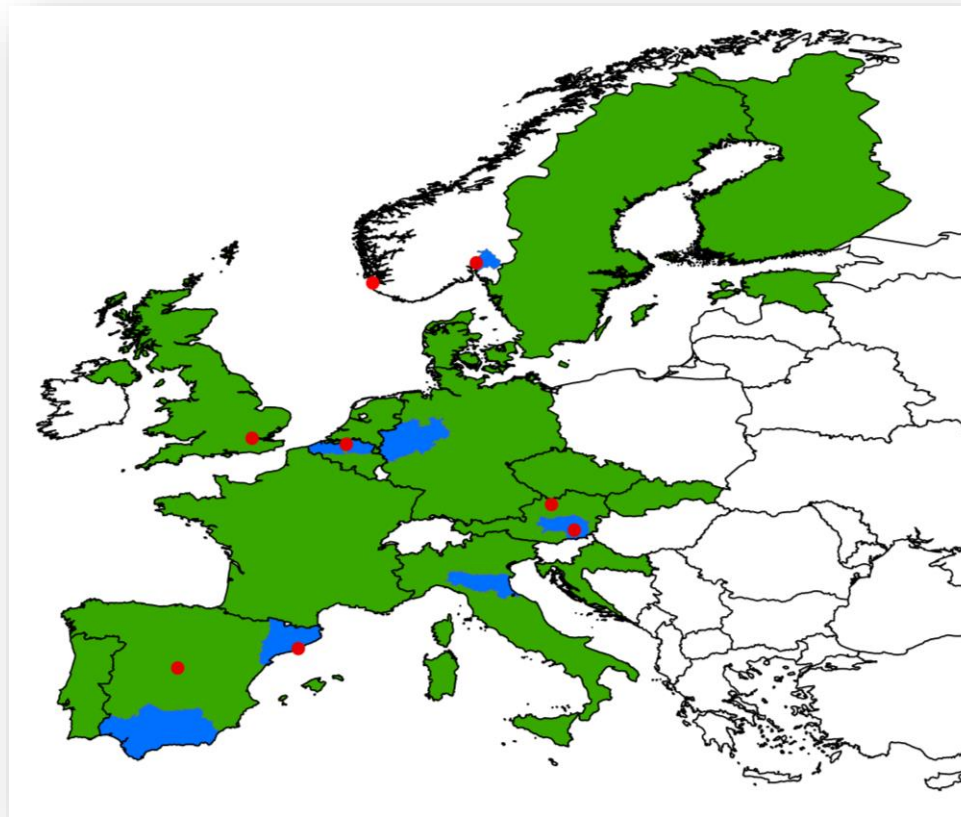
- » (Eventually) EU composite mapping exercise can provide support & guidance on:
 - » Data formats (GML,...)
 - » Use of a common EU grid
 - » Transformation errors, work load,...
 - » Provide guidance on adequate spatial resolution of model application
 - » Provide guidance on minimum quality level (Benchmarking procedure & Model Quality Objectives)
- » Could be a parallel “Pilot Track” with a few interested parties
 - » Not first priority now
 - » Work for 2016...

Call for contributions (sent out April 2015)

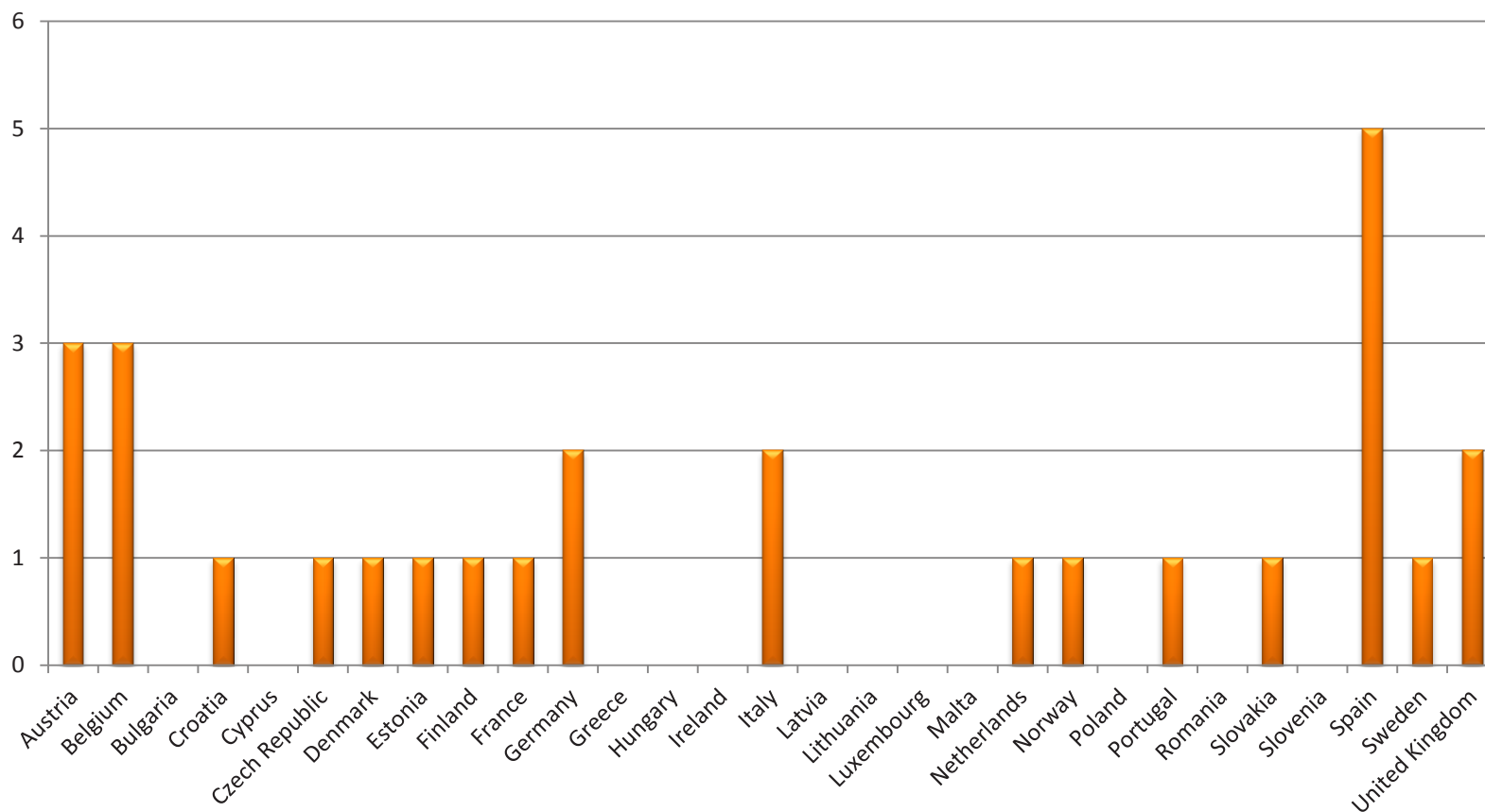
- » No → Why not (data availability, resources availability, political issues, confidentiality...)
- » Yes → Please provide some meta information about your air quality map:
 - » Modelled region
 - » Year(s) (preferably 2012)
 - » Pollutants/aggregation times
 - » Data format (netcdf, shape, ascii...)
 - » Geographical representation (grid, receptor, hybrid...)
 - » Spatial resolution
 - » Projection/coordinate system
 - » Data volume (in Mb)
 - » Is the data made routinely available (e.g. annually)
 - » Short description of the modelling system (or link to MDS)

FAIRMODE Feedback (so far...)

- » 28 positive feedbacks from 17 different countries → broad FAIRMODE support
- » 15 National Contact Points → “official” national maps



FAIRMODE Feedback: Multiple teams per country

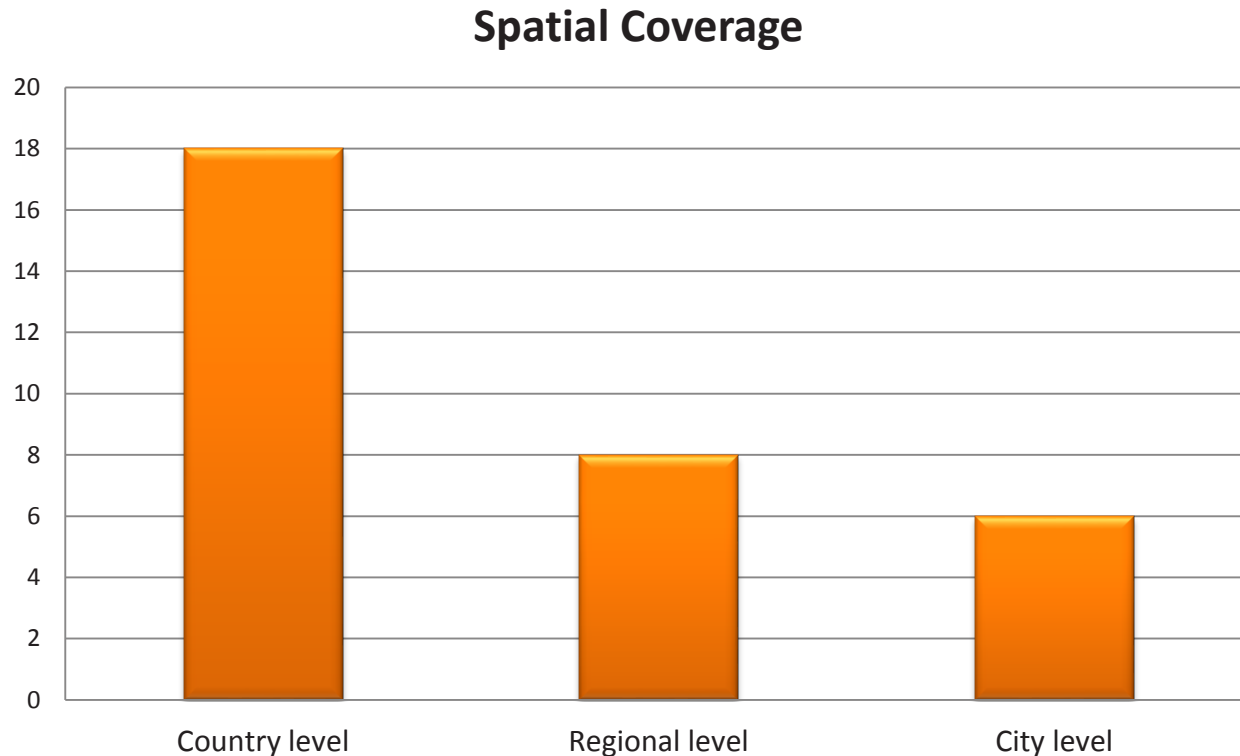


Country	Contact person		Country	Contact person
AT	Öttl Dietmar		ES	Padro Hernandez Ales*
AT	Stefan Oitzl		ES	Fernando Martin
AT	Hirtl Marcus		FI	Ari Karppinen
B	Frans Fierens		FR	Laurance Rouil*
B	Jan Bel		HR	Sandra Krmpotić*
B	David Roet		IT	Gabriele Zanini
CZ	Ondřej Vlček		IT	Michele Stortini
DE	Stephan Nordmann		NL	Joost Wesseling
DE	Hendrik Elbern		NO	Cristina Guerreiro
DK	Jesper Heile Christensen		PT	Alexandra Monteiro
EE	Erik Teinemaa		SE	Hans Backström
ES	Rafael Borge		SK	Jana Matejovicova
ES	Oriol Teixidó		UK	Daniel Brookes
ES	Maria Teresa Pay		UK	Jenny Stocker

**only verbal expression of interest*

FAIRMODE Feedback: Spatial coverage

» National, regional and local scale maps*



**EU wide maps are out of scope → MACC, Copernicus, EuroDelta, AQMEII...*

FAIRMODE feedback: meta data

- » Assessment years → in most cases 2012 available
- » Pollutants:
 - » PM10 annual average → 92%
 - » PM10 daily exceedances → 73%
 - » PM2.5 annual average → 80%
 - » NO2 annual average → 92%
 - » SO2 annual average → 73%
 - » O3 annual average → 54%
- » Spatial resolution: 10km down to 5m
- » Data formats:
 - » Mainly: ESRI ASCII, shape file, netcdf...
- » Projection system: complete “zoo”
- » Availability: in most cases annual updates

Supporting IT platform

- » Web based FAIRMODE platform
- » Functionalities:
 - » **Upload new maps**
 - » Manual process organized by WG1. Could be automated at a later stage if relevant.
 - » **Indicator Selection**
 - » Start with PM10 and NO2 annual averages in first prototype. Can be extended in next phase.
 - » **Visualize maps for Region of Interest**
 - » From EU down to urban scale.
 - » **Legend functionality**
 - » Options: default, automatic and user defined legends

Supporting IT platform

- » Functionalities:
 - » **Concentration profile**
 - » Concentration profiles along a user defined trajectory/line segment (select start & end point)
 - » **Link to Benchmarking**
 - » Every map should be accompanied by a FAIRMODE Benchmarking report → appreciation of quality of maps
 - » **Link to DELTA data base** (see next presentation Philippe Thunis)
 - » Every map should be accompanied by a DELTA input data set (selection of monitoring and modelling data at station locations) → opportunity for further exploration
 - » **Download**
 - » Download functionality for off-line analysis (e.g. AIRBASE)

Open issues

- » Data policy & copy right:
 - » Issue for a few maps → conditions still unclear...
 - » Implications for download functionality?
- » Data formats:
 - » A limited set of predefined formats (e.g. [*lat, lon, conc*]) or complete freedom (data delivery “as is”) → impact on manual upload
 - » EuroDelta & HTAP experiences → **see next presentation Kees Cuvelier**

Next steps...

- » Start data collection after Summer (September 2015)
 - » I will contact everybody who expressed interest so far
 - » More contributions are very welcome → open process!
- » First prototype ready by FAIRMODE Plenary Meeting, February 2016